ANALOG DEVICES

ADSP-2100 Family EZ Development Tools

ADDS-21XX-EZ

FEATURES

EZ-Tools Support Evaluation, Prototyping, and Debugging of ADSP-2101, ADSP-2105, and ADSP-2111 Systems
ADSP-2101 EZ Tools are Used to Develop ADSP-2105 Systems

EZ-ICE™ EMULATORS

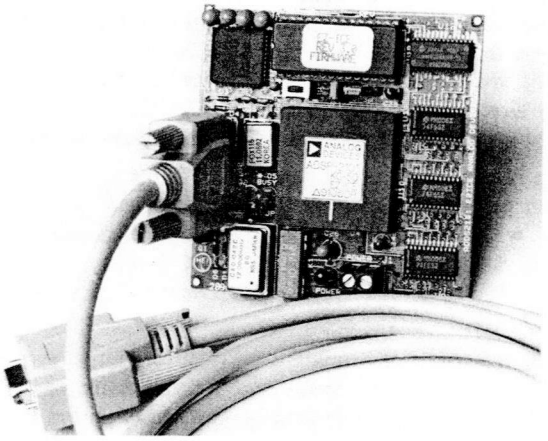
Full-Speed, In-Circuit Emulation:
ADSP-2101 EZ-ICE Emulates Up to 16.67 MHz
ADSP-2111 EZ-ICE Emulates Up to 13 MHz
3.3″ × 3.3″ Board with RS-232 Port
Plugs Directly into Processor Socket on Target Board
Single Step Capability
Memory Upload/Download with IBM PC
Examine and Alter Registers, Program Memory, and Data Memory
Stand-Alone Operation for Software Debugging without Target System

EZ-LAB™ EVALUATION BOARDS

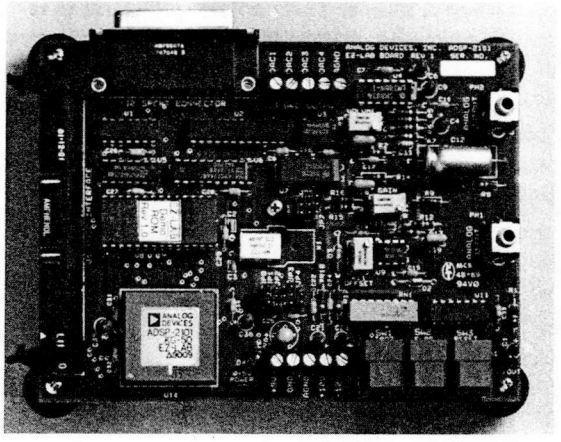
Low Cost Evaluation/Demonstration Platform:
ADSP-2101 EZ-LAB Includes 12.5 MHz ADSP-2101
ADSP-2111 EZ-LAB Includes 13 MHz ADSP-2111
Includes 64K × 8-Bit Socketed Boot EPROM, Pre-Programmed with DSP Demo Programs
Four Channel, 8-Bit DAC (D/A Converter) Port
Voice I/O Port with Microphone Input and Powered Output for Speaker
Bus Expansion Connector Allows Additional I/O and Full Memory Expansion
Serial Port Interface via SPORT Connector

EZ-KIT DSP STARTER PACKAGE

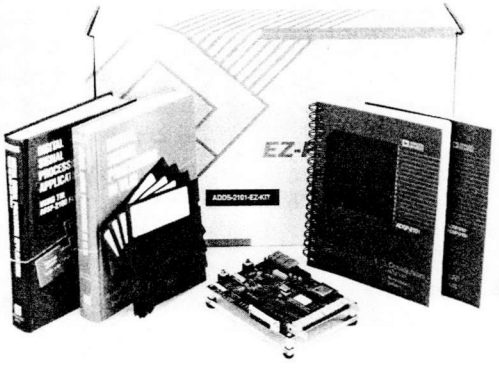
ADSP-2101 EZ-LAB Evaluation Board
Assembler/Linker and ADSP-2101/ADSP-2105 Simulator Software for IBM PC
***Digital Signal Processing Applications Using the ADSP-2100 Family*, an Applications Handbook with Source Code Diskette**
***Digital Signal Processing Laboratory Using the ADSP-2101 Microcomputer*, a Laboratory Workbook with Introductory DSP Experiments**



EZ-ICE Emulator



EZ-LAB Evaluation Board



EZ-Kit DSP Starter Package

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 617/329-4700 Fax: 617/326-8703 Twx: 710/394-6577
Telex: 924491 Cable: ANALOG NORWOODMASS

EZ-ICE

The EZ-ICE Emulator is a 3.3″ × 3.3″ in-circuit probe board containing an emulator version of the ADSP-2101 or ADSP-2111. The pins that protrude from the bottom of the board are inserted into a socket in a target system; your target socket must accept the PGA footprint of the emulated processor.

An umbilical cord (pin extender) is also available as an option. Use the umbilical cord to make the emulator-to-target connection where the height of components surrounding the target processor (on your system board) or the space between your boards prohibit direct connection of the EZ-ICE to the target socket. The cord may limit the speed at which programs can be run.

You can run EZ-ICE at full speed. There is no degradation of processor performance or signal timing other than $\overline{BR}$, $\overline{BG}$ and $\overline{RESET}$, which are slightly delayed. You can select via a jumper either the target system clock or the EZ-ICE clock. The oscillator is socketed to allow the use of other oscillator devices to achieve different clock speeds.

You have the option of running programs from target system memory, emulator overlay memory or a combination of both. The 8K by 24-bit overlay program/data memory option is jumper selectable.

Monitor firmware in EZ-ICE controls all emulator functions. The user interface is simple. There are no commands to remember; all functions are controlled using the cursor or menu selections. In addition, EZ-ICE firmware intercepts illegal user inputs, making debugging work easier.

Control and debug features include single-step capabilities with or without register displays and multiple breakpoint capability (with up to 16 breakpoints individually set).

At power-up, the host processor is automatically reset and a diagnostic check is performed to ensure that both host memory and EZ-ICE are functional. A report of any failures found is automatically displayed.

Additional Equipment Required

EZ-ICE requires a +5 V dc power supply capable of supplying 1 A of current.

For display and input, EZ-ICE requires either a VT100 as the terminal device or a personal computer (PC) running a terminal emulation program. The program should be capable of emulating a VT100-type terminal and allow the transfer of ASCII files between the PC and EZ-ICE. EZ-ICE is connected to the PC via an RS-232 cable. A 9-pin female D-type connector is located on the EZ-ICE board. A 25-to-9 pin adapter and an RS-232 cable are both provided with EZ-ICE, to connect to the PC.

EZ-ICE automatically adjusts its baud rate to match the host PC's baud rate. You set the baud rate you want on your PC or VT100 terminal. A baud rate of 9600 or 19200 is recommended.

EZ-ICE vs. Full-Featured Emulator

EZ-ICE is an easy-to-use emulator that does not have some of the advanced features of the full featured emulator (ADDS-2101-ICE or ADDS-2111-ICE). The full-featured emulator provides these additional capabilities:

- Trace capability
- Hardware event triggers
- Software break expressions
- Data memory breakpoints (watchpoints)
- Overlay memory for full program memory, data memory and boot memory spaces
- Can monitor the state of all pins
- Can plot memory contents
- Symbolic debug and on-line assembly
- Session record is kept by emulator firmware
- Can use breakpoints with internal memory while in GO mode
- Has the same configurable, multiple-window user interface as the Simulator

ADSP-2101/ADSP-2105 Surface Mount Adaptors

Two adaptors are available for emulation of the ADSP-2101 in its surface mount packages. For the 68-pin PLCC package of the ADSP-2101 (and ADSP-2105), a PGA-to-PLCC adaptor is available from the vendors listed in the ordering guide. For the 80-pin PQFP package of the ADSP-2101, a 68-pin PGA to 80-pin PQFP adaptor is available from Analog Devices.

The ADDS-2101-PGA/PQFP is a surface-mountable PGA-to-PQFP adaptor. This adaptor provides a footprint that exactly matches that of the 80-pin PQFP package. This solution requires no extra space around the adaptor nor does it require an extra through-hole to the PQFP package, allowing the use of exactly the same PCB in production. The PGA-to-PQFP adaptor is surface mounted in the usual manner, and the PGA connector of the ADSP-2101 EZ-ICE can be plugged in directly.

ADSP-2111 Surface Mount Adaptors

Two types of 100-pin PGA-to-PQFP adaptors are available for the ADSP-2111 EZ-ICE, from Analog Devices. One of the adaptors is for surface mounting, and one mates with a through-hole socket.

The ADDS-2100-PGA/PQFP-N is a surface-mountable PGA-to-PQFP adaptor that can be used with the ADSP-2111 EZ-ICE. This adaptor provides a footprint that exactly matches that of the standard 100-pin PQFP package. This solution requires no extra space around the adaptor, nor does it require an extra through-hole to the PQFP package, allowing the use of exactly the same PCB in production. The PGA-to-PQFP adaptor is surface mounted in the usual manner, and the PGA connector of the ADSP-2111 EZ-ICE can be plugged in directly.

The ADDS-2100-PGA/PQFP-S is a PGA-to-PQFP adaptor for socketed PQFP packages. This adaptor can be inserted into an AMP PQFP through-hole socket (AMP part number 821949-4). The ADDS-2100-PGA/PQFP-S adaptor comes complete with one of these AMP sockets.

EZ-LAB

The EZ-LAB Evaluation Board is a complete ADSP-2101 or ADSP-2111 system on a 4 1/2" by 6" board. It allows you to test coded applications in real time. No host or PC is needed to operate EZ-LAB. At reset, the processor on EZ-LAB boots code and program memory data into its internal program memory from a 64K × 8-bit EPROM. It then executes the code.

The EPROM provided with EZ-LAB contains several prepared demonstrations. You can run your own programs on the EZ-LAB by replacing the EPROM containing the demonstrations with one of your own. No additional memory board is needed.

An EPROM emulator can also be used to simplify running and testing your programs, by allowing you to quickly download programs from a PC.

You can use the prepared demonstrations on EZ-LAB, which include speech and graphics applications, to familiarize yourself with and evaluate the ADSP-2101 (and ADSP-2105) or ADSP-2111. The EPROM is mapped into the boot memory space. Upon reset, the processor loads boot page 0 into its internal program memory and begins execution. During program execution, any of the eight boot pages can be loaded into the processor under software control.

A codec is attached to serial port 0. You can configure the other serial port for interrupts and flags by changing on-board jumpers. The input signal to the codec can be a microphone, signal generator or any other high impedance source, and the resulting output signal can drive a small speaker.

EZ-LAB comes with a socket-mounted 12.288 MHz crystal. This frequency allows proper operation of the codec. The socket lets you replace this crystal to achieve different clock speeds.

The demonstrations use the microphone and speaker connections for audio input and output. EZ-LAB has four DAC outputs to connect to an oscilloscope for display. In addition, there is an expansion connector, a serial port connector and, on the ADSP-2111 EZ-LAB, a host port connector. The connectors allow you to access the serial ports, external address bus, external data bus, control signals, interrupt lines and, on the ADSP-2111, the host interface port.

EZ-LAB provides manual control of several functions: push-buttons assert the $\overline{IRQ2}$ interrupt and FLAG IN pins and an on-board hardware RESET switch resets EZ-LAB.

The demonstration board is capable of stand-alone operation. All you have to provide is a +5 V dc power supply capable of supplying 1 A and a ±12 V dc power supply capable of supplying 200 mA with a common power return.

Using EZ-LAB and EZ-ICE Together

You can combine EZ-LAB and EZ-ICE to form a high speed DSP workstation with an interactive, window-based debugging interface. Simply remove the processor device from the EZ-LAB board and plug in an ADSP-2101 or ADSP-2111 EZ-ICE. This combination lets you prototype and evaluate your application with virtually no initial time investment in hardware design.

ADSP-2105 SYSTEM DEVELOPMENT

The ADSP-2101 EZ Development Tools support the ADSP-2105 because the ADSP-2105's architecture is a subset of the ADSP-2101. The two processors are identical, except for the following: the ADSP-2105 has one serial port (instead of two) and has half the internal memory of the ADSP-2101.

The ADSP-2101 EZ-LAB can be used to evaluate the ADSP-2105, and the ADSP-2101 EZ-ICE is used for emulation and debugging in ADSP-2105 target systems.

ORDERING GUIDE

Part Number	Description
ADDS-2101-EZ-ICE	ADSP-2101 EZ-ICE Emulator
ADDS-2101-EZ-LAB	ADSP-2101 EZ-LAB Evaluation Board
ADDS-2111-EZ-ICE	ADSP-2111 EZ-ICE Emulator
ADDS-2111-EZ-LAB	ADSP-2111 EZ-LAB Evaluation Board
ADDS-2101-EZ-KIT	ADSP-2101 EZ-Kit Starter Package*
Optional Accessories	
ADDS-2101-UMBIL	ADSP-2101 Probe-to-Target Umbilical Cord (8″)
ADDS-2111-UMBIL	ADSP-2111 Probe-to-Target Umbilical Cord (8″)
ADDS-2101-PGA/PQFP	ADSP-2101 68-Pin PGA to 80-Pin PQFP Adaptor (Available 1992)
ADDS-2100-PGA/PQFP-N	100-Pin PGA-to-PQFP Adaptor, Surface Mount (for ADSP-2111 EZ-ICE)
ADDS-2100-PGA/PQFP-S	100-Pin PGA-to-PQFP Adaptor, Socketed (for ADSP-2111 EZ-ICE)
Available from Other Vendors	
AP3-68-PGA	68-Pin PGA-PLCC Adaptor (for ADSP-2101 and ADSP-2105) *Available from* Emulation Technology 2344 Walsh Ave. Bldg. F Santa Clara, CA 95051 (408) 982-0660
68-PGA/PLCC	68-Pin PGA-PLCC Adaptor (for ADSP-2101 and ADSP-2105) *Available from:* EDI Corp. P.O. Box 366 Patterson, CA 95363 (209) 892-3270

*Includes a discount coupon for ADSP-2100 Family Training Workshop.

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